ROLE OF ULTRASOUND IN BLEEDING PER VAGINUM IN EARLY PREGNANCY

THESIS

FOR

DOCTOR OF MEDICINE

(RADIODIAGNOSIS)

BUNDELKHAND UNIVERSITY
JHANSI (U. P.)

1996

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D E D I C A T E D T O

M Y S I S T E R

A N D P A R E N T S

C E R T I F I C A T E

This is to certify that the work entitled "ROLE OF ULTRASOUND IN BLEEDING PER VAGINUM IN EARLY PREGNANCY", which is being submitted as a thesis for M.D.(Radio-diagnosis) by DR. SHIPRA RAMPAL has been carried out in the Department of Radio-diagnosis, M.L.B. Medical College, Jhansi.

She has put in necessary stay in the department as per University regulations.

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ACKNOWLEDGEMENTS

With an overwhelming sense of gratitude, I wish to acknowledge all those who made the completion of this thesis possible.

I am highly obliged and feel deeply honoured to express my profound sense of gratefulness to my esteemed, learned and worthy guide, Dr. A.K.Gupta, M.D., Associate Professor & Head, Department of Radio-diagnosis, M.L.B. Medical College, Jhansi, for his excellent guidance, invaluable suggestions, untiring patience backed by his unlimited knowledge. His ever-helping nature, constructive criticism, most perceptive mind and great sense of precision were constant source of inspiration during the course of this thesis work. I shall be forever indebted to his generosity for making available all facilities to work.

I owe my sincerest thanks to my respected Co-guide, Dr. U. Agarwal, M.S., Associate Professor, Department of Obstetrics & Gynaecology, M.L.B. Medical College, Jhansi, for her able supervision and constant attention and keeping my spirits high during the course of the study.

It is a matter of great privilege to acknowledge my deepest sense of gratitude to my respected Co-guide, Dr. G. Kumar, M.D., Assistant Professor, Department of Radio-diagnosis, M.L.B.Medical College, Jhansi, for his kind help, regular guidance, valuable teachings and supervision.

I extend my thanks to my colleagues who helped me in the completion of this study.

I also offer my thanks to Mr. K.M. Thomas for the meticulous manner in which he typed the script of the thesis.

My special thanks goes to my husband, Dr. G.P. Kaushal without whom I would never have been able to finish the work smoothly. I also thank him for the constant encouragement and timely help in all aspects which destined this study to completion.

I wish to acknowledge the kind and benevolent support of my parents-in-law and parents.

The debt I owe to my family members is supreme and can never be repaid in full.

Dated : 7.10.95

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C O N T E N T S

INTRODUCTION

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In the present era of Science and Technology our main aim is to ensure that every new born gets an optimal chance for complete development, both physically and mentally. Therefore, attempts in ascertaining the well being of the fetus inside the uterus has become an important issue. In the past the obstetricians were relying upon their clinical skill in differentiating normal from abnormal pregnancy. It was in 1940 when the use of Ultrasound in medical practice was recognised. In 1958 Donald and his associates first used the ultrasound for the diagnosis in obstetrics and gynaecological disorders.

Bleeding per vaginum is a frequent complication in early pregnancy. The reported incidence is 16% of all pregnancies (Hertig & Livingstone, 1944) and it has been estimated that 10-20% of all pregnancies abort spontaneously (Jeffcoate, 1975).

The common causes of bleeding per vaginum include abortions of various types (Threatened, Incomplete, Inevitable, Missed), ectopic pregnancy, hydatidi form mole, placental abnormality and pathological conditions of genital tract e.g. cervical polyp, vaginal varicosity, carcinoma cervix.

Various newer diagnostic investigations to assess fetal well being are now used, e.g. hormonal assay, amniocentesis, ultrasonography. Since subnormal hormone levels may occur relatively late in the clinical course, Ultrasound scanning yields more useful result compared with hormone assay particularly after the 9th week (Basil, H.O., Yuen et al, 1981). Ultrasound offers a glimpse of the fetal status during the early months of pregnancy especially the demonstration of fetal heart activity which is an excellent prognostic sign in patients with bleeding P/V in early pregnancy because 90-96% of these patients will continue their pregnancies to term (Jouppila, 1980).

In the absence of precise diagnosis, treatment is empirical and results in maternal risk, fetal wastage, unnecessary hospitalisation and emotional stress to the mother, it is necessary that investigation should be devised to detect viability and nature of pregnancy. These requirements are fulfilled by ultrasonography, its advantages are -

- No side effects or hazards to fetus or mother.
- Is non-invasive and non-ionising technique.
- Can be repeated safely.
- Bed side scanning is possible.

It can also reliably diagnose unsalvagable pregnancies e.g. missed abortion, hydatidi form mole, ectopic

pregnancy etc. other abnormalities like placenta covering, internal os, intrauterine haematoma which account for the cause of bleeding. The only requirement is a full urinary bladder which enables visualisation of pelvic structures.

The common and important obstetrical indications of ultrasound scanning are -

- Estimation of gestational age,
- Evaluation of fetal growth,
- Vaginal bleeding in abnormal pregnancy,
- Placental localisation,
- Determination of fetal presentation in labour,
- Suspected multiple gestation,
- Adjunct to amniocentesis,
- Significant discrepancy in uterine size/ clinical dates,
- Pelvic mass detected clinically,
- Gestational trophoblastic disease,
- Suspected fetal death.

The principle of ultrasound is based on the utilisation of pieso-electric and reverse piezo electric effect i.e. mechanical stress to a quarts crystal results in production of sound waves in forward direction. The reflected returning echo is analysed by computer and constructs an image. The normal hearing range of sound is 20 - 20,000 Herts. Ultrasound waves are above this

range and comprise of frequencies 1 - 10 Mega Hertz. The ultrasound equipment has a transducer, a signal receiver and a computer to construct an image.

The ultrasound transducer contains piezo electric material - Lead Titanum Zirconate. When an electric current is passed through the crystal, a pulse of ultrasound is produced which, after passing through tissues, is reflected back in different intensities depending on their acoustic impedence which in turn is determined by the tissue density and its acoustic velocity. The returning echoes are converted back into electrical impulses in the transducer sent to computer which construct an image and displays it on the screen as a real time scan. The commonly used transducer in obstetrics has a frequency of 3.5 MHz. An important principle in ultrasonography is that water is an excellent transmitter of ultrasound impulses because of impedence matching whereas air (bowel gas) almost blocks them due to impedence mismatching. Bladder must be full in order to provide an acoustic window till approximately 16 wks of pregnancy. Beyond that date the uterus pushes away the surrounding bowels and the amniotic fluid by itself forms a good propagating medium.

After full urinary bladder, the following structures are seen for -

<u>Uterus</u> :

- Gestation sac - position, number, size.

- Fetus - presence, number, fetal heart, fetal movements, early fetal biometry (crown rump length, biparietal diameter, abdominal & head circumference), other movements - head flexion, extension eyelids, fetal breathing, limbs, thorax, congenital anomalies.
- Placenta - normal, vesicular, snowstorm.

Adnexal region :

- Cystic mass - ectopic pregnancy, corpus luteal cyst, ovarian cyst.
- Solid mass - fibroid, ovarian.
- Culdesac - fluid, blood, ectopic pregnancy.

The purpose of ultrasound scanning in early pregnancy is to evaluate the complications, establish criteria for diagnosing dead or abnormal fetus and to predict which pregnancies will eventually abort.

In the present study, the primary aim is to put-forth that the criteria of normality or abnormality as judged by ultrasound, sufficient to establish a pregnancy being normal or abnormal. The abnormal pregnancy can be terminated easily without any fear of error.

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REVIEW OF LITERATURE

REVIEW OF LITERATURE

Bleeding per vaginum is commonest early pregnancy complication, often attracting the attention of medical practitioners. Since time, various clinical and investigative methods have been developed to explore this problem so as to be more scientific, more therapeutic and prognostic while dealing with such cases. Of the various investigative methods like hormonal assays, ultrasonic assessments, ultrasound has become an important non-invasive biologically inert tool in obstetrician's armamentarium. Ultrasonography of uterine contents in the first half of pregnancy has been used as an aid to obstetric management (Bradley, Watson and Mitchell, 1973).

In 95% of cases bleeding is a symptom of threatened abortion, in more than 4% of cases, it indicates the possible presence of other early complications of pregnancy like low lying placenta, ectopic pregnancy (approx. 1%) and Hydatidi form mole (0.5 - 2%). In the problem of recurrent bleeding per vaginum decision has to be the one between normal or abnormal, extrauterine or intrauterine and viable or non-viable.

The possible ultrasonic diagnosis of early pregnancy bleeding could be threatened abortion, missed abortion, inevitable abortion, Ectopic gestation, Hydatidi form mole or blighted ovum.

Mac Vicar & Donald (1963) studied 135 cases of threatened abortion in early pregnancy. In 65 cases the sonar was used to confirm the clinical impressions of a live pregnancy, especially when the biological assays were contrary to the clinical findings. Of these 55 showed foetal echoes within a cystic uterus and were diagnosed as continuing pregnancies. Four cases were diagnosed as cases of incomplete abortion. In one case a wrong diagnosis of missed abortion was made and one case was wrongly diagnosed as continuing pregnancy, which turned out to be a carneous mole. Thus they suggested that "though a missed abortion with the development of carneous mole may be suspected, it should not be positively diagnosed until a repeat examination with similar scans is carried out after a lapse of two weeks".

Mac Vicar & Donald (1963) used sonar for the diagnosis of suspected cases of hydatide-form mole, it's clinical diagnosis remains difficult until the first vesicle is passed out per vaginum. They studied 55 cases in which hydatidiform mole was suspected. Persistent or repeated bleeding per vaginum despite complete bed rest was the most common symptom allied, often with uterine

enlargement much greater than the period of gestation. 29 cases showed foetus. One case found to be partial mole with foetus. This patient later aborted a normal fetus with the placenta showing evidence of vesicular degeneration. In 3 cases, a provisional diagnosis of continuing pregnancy was made and proved correct. In 16 cases, the diagnosis of hydatidiform mole was made out of which 15 were confirmed by histology. In their study, only 3 cases were wrongly diagnosed as hydatidi form mole. They suggested that hydatidiform mole should not be diagnosed unless no definite echoes are seen within the uterus at normal scanning. At higher power output reverberations within the uterus of the sound may cause diffuse repetitive small echoes. The uterine outline should also clearly be seen at normal output. The presence of a fetus may cast a shadow on the rear of the uterus due to alteration with the structure of fetus. A hydatidiform mole will not do this.

Accuracy of Ultrasound -

Donald et al (1972) have very nicely described how ultrasound echo sounding can be of help in differential diagnosis before urine tests indicate that the pregnancy is doomed (Donald, 1968; 1969; Donald and Abdulla, 1967; Robinson, 1972).

Kukard (1974) studied 300 patients with pregnancy complication at less than 20 weeks and found the overall

accuracy of ultrasound was 87.2% compared with 32.7% of clinical examination. Only in the diagnosis of ectopic pregnancy the error approached that of the clinician but it still remained superior (55% accuracy with ultrasound compared with 33% clinically).

Duff (1975) made a comparison between predictions made by sonar, urinary hormone assays and clinical judgement in a series of 100 patients admitted with a diagnosis of threatened abortion. Assay of estrogen excretion was most accurate (86.5%) in predicting the ultimate outcome of pregnancy, but did not give as much information as sonar examination which gave an accurate prognosis in 84% of cases and was quicker to perform. Assay of urinary pregnanediol excretion gave an accurate indication of outcome in 74% of cases and 24 hrs urinary HCG estimations provided an accurate prediction in only 54.5% of cases. Clinical examination presented the usual difficulties in assessing uterine size and predicting abortion from the amount of bleeding and pain.

Similar supremacy of ultrasound has also been shown by Duff (1980) and Eriken (1980). Eriksen et al (1986) evaluated the diagnostic and prognostic value of ultrasound, B-HCG subunit and progesterone in a prospective study of 169 patients with threatened abortion. With ultrasound a correct diagnosis of the in-utero situation was made at admission in 93% and

after 1 week in 99% of the cases and ultrasound was shown to have the highest sensitivity in detecting a pathologic pregnancy.

T.C. Gorade & A.M. Shrotri (1991) studied 90 patients presenting with vaginal bleeding before 20 weeks of pregnancy who were subjected to ultrasonographic evaluation. The overall accuracy of clinical diagnosis was observed to be around 69% in relation to ultrasonographic diagnosis, ultrasound could efficiently differentiate normal viable pregnancies (about 50%) from abnormal pregnancies (43%) and helped in early decision of termination of non-viable and abnormal pregnancies. In addition, it helped to exclude pregnancy in 7% patients and enabled the diagnosis of complete abortion in 4% patients who could be spared unnecessary hospitalisation and surgical interventions.

In a similar study Anuradha, Chandra Prakash et al (1992) predicted the overall accuracy rate of ultrasonic diagnosis in cases of bleeding per vaginum in early pregnancy as 95.5%.

N. Tewari et al (1992) in a case study of 200 patients with main complaint of bleeding per vaginum following amenorrhoea of 6 to 24 weeks, examined by ultrasonography and vaginal cytology. The smears from the upper part of the lateral vaginal wall were studied after papanicolau staining for Karyopyknotic index (KPI).

KPI was taken as an indicator of hormonal balance. KPI of less than 10 was considered good and compatible with normal pregnancy. By ultrasonography 69% were viable pregnancies, and of non-viable pregnancies (31%) had KPI below 10. Incidence of abortion was 18% in cases with smears showing KPI less than 10, while it was 58.62% in cases with KPI more than 10. They concluded that pregnancy with ultrasonographically confirmed non-viable fetus can be electively terminated avoiding prolonged hospital stay. On the other hand, in pregnancy with ultrasonographically viable fetus, progesterone deficiency as a cause of threatened abortion can be diagnosed by vaginal cytology examination.

Ultrasound as a prognostic tool -

Spontaneous abortion or early pregnancy failure is one of the most frequent complications of pregnancy but great difficulty is still experienced in reliably anticipating which pregnancies will terminate in abortion and in many cases a definitive diagnosis is only made when the cervix is found to be opening. This situation is particularly distressing to those patients with a history of threatened abortion or recurrent abortion who abort despite resting in hospital for many weeks. There is therefore, a need for a technique which will allow an early diagnosis to be made in these patients, preferably with such certainity that a more active line of management can be pursued if so desired.

In recent years assays of plasma placental lactogen (Niven et al, 1972), serum alpha fetoproteins (Seppala and Ruoslahti, 1972), urinary estrogen, pregnanediol and human chorionic gonadotrophin (Brown et al, 1970) have all been shown to be useful guide to the outcome of threatened abortion. But the overlap between their values as sole arbitors of which pregnancies should be terminated should not be considered.

In addition, as the significance of a result may depend on the maturity of pregnancy, uncertain or mistaken dates could end to a result being fairly interpreted. With respect to plasma placental lactogen (Niven et al, 1972) and urinary estrogen and pregnanediol assay (Brown et al, 1970) however, levels below the lower limit of normal for any gestational age indicate an abnormal pregnancy irrespective of maturity.

A very different approach to the diagnosis of early pregnancy is ultrasonography. Donald (1972) correlated the outcome of 141 cases of bleeding in the first trimester of pregnancy with the findings obtained at the first and subsequent ultrasonic examinations. Fifty-seven patients out of 66 patients with abnormal ultrasound findings of blighted ovum aborted and 10 out of 75 patients in whom pregnancy continued the ultrasonic appearance was abnormal on at least one occasion. The false positive and false negative rates were therefore

13.3% and 13.6% respectively. The sonar features which they considered abnormal included loss of definition of gestation sac, a "small for date" gestation sac, failure of growth of sac over a period of one or two weeks, a low position of the sac and absence of fetal echoes.

Hellman et al (1973) in a series of 140 patients reported very similar false positive and false negative rates of 10.5% and 13.6% respectively. But these high false positive rates and subjective nature of the criteria of abnormality precluded the use of the above criteria as a means of reliably indicating which pregnancies merit termination. Recently, however three techniques of a more objective nature have been described for the sonar assessment of early pregnancy; the detection of fetal heart movements (Robinson, 1972) and the measurement of fetal crown-rump length (Robinson, 1973) both from seven weeks of amenorrhoea and the estimation of gestational sac volume from five weeks of amenorrhoea (Robinson, 1975).

Robinson (1975) evaluated sonar C.R.L. measurements and found that between 6-14 wks, gestational age can be estimated to within 4-7 days with 95% confidence limits on the basis of a single measurement. In early pregnancy, the standard deviation of gestational sac mean diameter, crown rump length and B.P.D. were found to be 5.1, 3.3 and 2.42 days respectively (Selberg, 1982). Robinson (1975) used the above

criteria to detect early pregnancy failure and concluded that given a knowledge of menstrual history it is possible to diagnose virtually all cases of blighted ovum, missed abortion and hydatidiform mole, by a single sonar examination; but in 'live abortions' there were no abnormal trends or results in any of the three parameters studied.

Eriksen and Philipsen (1980) studying 97 patients with early pregnancy bleeding showed that 92% patients with ultrasound diagnosis of fetal heart movement at first scan were carried to term and 91% without fetal heart movements aborted.

Sakamoto (1982) in a study of 318 cases with threatened abortion found abnormal gestational sac diameter can predict cases going to abort in 78% cases, whereas fetal heart movement on ultrasound was found to be the most decesive information about the prognosis of threatened abortion; all 112 cases without fetal heart action after 7th week ended in abortion and conversely 98.1% of 206 cases in which fetal heart action was confirmed that abortion did not occur. In the control group of 447 cases in which fetal heart action was confirmed; only 6 (1.3%) aborted.

Safat, R. (1987) in a study of 90 cases of early pregnancy bleeding found that out of 62 cases of

clinically diagnosed threatened abortion, ultrasound confirmed the diagnosis in 45 cases.

Various associated ultrasound abnormalities in cases with threatened abortion have been described. These included low-lying placenta, intra-uterine haemorrhage, multiple gestation sac etc.

The diagnosis of low-lying placenta (i.e. placenta covering the os partially or completely or occupying the lower uterine segment) was falacious occasionally. Zemlyn (1978) showed that with over-filled urinary bladder anterior lower segment may be compressed with the creation of pseudocervix. The normal cervix does not measure more than 6 cm in length; therefore, if a placenta does not come within 6 cm or less of the external os, there will be no placenta praevia.

Migration of low-lying placenta to upper segment was seen by Chapman (1979). Van Bargen (1980) opined that placental migration was due to elongation of the lower uterine segment.

Varma (1981) showed that placenta which covered the internal os completely or partially was associated with a higher incidence of bleeding, abortion and placenta praevia.

Mantoni (1985) in a study of 244 patients with early pregnancy bleeding found 25 cases of low-lying

placenta. Three of them had a spontaneous abortion. By 24 wks, the placenta ascended to upper uterine segment.

Ruparelia (1985) later observed that since the posterior low lying placenta were those most likely to remain praevia, they required follow-up soon.

Some investigators have shown intra-uterine hematoma, defined as echo-free area between the uterine wall and the membranes. Mantoni (1981) showed that if the volume of hematoma was more than 50 ml after 16 weeks, there was a considerable risk of abortion and premature delivery.

Goldstein (1983) found no correlation between the volume of haemorrhage and final outcome, but observed greater risk to the fetus even if signs of fetal life were present initially on sonography. They observed that in it's absence, the identification of fetal heart activity was associated with 100% pregnancy continuation and the observation of sub-chorionic bleeding decreased that rate to 80%.

Mantoni (1985) found in a study of 244 patients with threatened abortion two patients with hematoma more than 50 ml had abortion and premature delivery and four cases with hematoma less than 50 ml had successful outcome of their pregnancies.

Multiple gestation was often found in early ultrasound scanning. Robinson (1977) in a study of 30 cases of twin diagnosed in early pregnancy found that 14 cases were carried to term and 10 out of 11 cases with one normal pregnancy and co-existant blighted ovum had delivery of 10 single babies and one had abortion of single fetus.

In a study of 244 cases with threatened abortion Mantoni (1985) found 18 cases of twin : three sets of twins, three cases of twin blighted ova and 12 cases of blighted ovum and normal pregnancy. Among the 12 patients with the combination of blighted ovum and normal pregnancy, only one subsequently aborted, whereas other patients experienced vaginal bleeding until the blighted sac had disappeared.

Ultrasound was found to be the method of choice for the diagnosis of hydatidiform mole. Typical sonographic appearance of hydatidiform mole is snow storm appearance. Santos Ramos et al (1980) studied 313 patients referred for sonography because of clinical suspicion of molar gestation. They found in the 50 patients with proved molar gestation there were 2 false positive and two false negative sonographic interpretations. Theca lutein cysts were detected in 10% of patients by clinical examination, whereas they were detected by sonography in 37% of cases. Patients with volumetrically large for dates uterus or with theca lutein cysts did not have a higher incidence

of part evacuation invasive mole or choriocarcinoma. They concluded that sonography remained an excellent diagnostic technique but could not predict the post-evaluation clinical course. They found that the classic "snow-storm" or radiating spicule pattern was noted in 38 of 50 (76%) cases of molar pregnancy, large sonolucent areas due to blood clot intermingled with the typical appearance in 7 cases (14%), a central anechoic area (clot) surrounded by a ring of echoes in 2 patients (4%) and partial mole in 3 cases. They found vaginal bleeding as the most common symptom in 90% cases. Woodward (1980) found that in early moles, the vesicles were poorly developed and the pregnancy might be confused with macerated placenta as shown in missed abortion. When the vesicles were better developed, they produced the typical honey comb appearance.

Reid et al (1983) found similar sonographic features between complete and partial hydatidiform mole, placental hydropic degeneration, incomplete and missed abortion, retained products of conception and occasionally leiomyoma.

Ectopic pregnancy is one of the causes of early pregnancy bleeding. Macleod and Wright (1978) examined 36 cases of suspected ectopic pregnancies sonographically. Ultrasound demonstrated 12 cases of ectopic pregnancies of which 11 were confirmed later by laparoscopy and

laparotomy and one patient has haemorrhagic corpus luteum cyst (false positive). One ultrasound diagnosis of tubovarian mass was found to be ectopic (false negative).

Pedersen (1980) in a consecutive series of 103 cases of suspected ectopic pregnancies found true positive (adnexal mass with fetal heart activity) in 4 out of 4 cases (100%), true negative (no adnexal mass & simple cyst) in 71 out of 72 cases (99%). In 5 out of 24 cases of adnexal mass without fetal heart activity ectopic pregnancy was confirmed later.

Similar observations were made by Jorgensen (1980) who ultrasonically examined 136 women with suspected ectopic pregnancy ; 61 of them were found to be intra-uterine pregnancy. In 36 cases, laparoscopy was performed, ectopic pregnancy was diagnosed in 21 cases. He advocated estimation serum HCG & laparoscopy as an essential to confirm ectopic pregnancy.

Decidual cast in ectopic pregnancy often produce similar sonographic image of gestational sac (Spirt, 1981; Mantoni, 1983). But 'true' gestation sac can be distinguished from the pseudogestation sac by the presence of double decidual sac (formed by gestational sac wall and closely applied decidua capsularis and parietalis) in intra-uterine pregnancy (Bradley, 1982).

Nyberg et al (1983) found that intra-uterine double decidual sac was correlated with an intra-uterine

pregnancy in 98.3% cases and those who lacked double decidual sac only 6% intra-uterine pregnancy, remaining had either ectopic pregnancy or abnormal intra-uterine pregnancy.

Romero (1984) concluded that in practice ultrasound was more useful in excluding the diagnosis by demonstrating an intra-uterine pregnancy because the coexistance of intra-uterine pregnancy had extra-uterine pregnancy is so rare - 1 : 30,000 (Berges, 1972).

In a study by Shwartz and Di Pietro, only 9% of patients with clinically suspected ectopic pregnancy actually had an ectopic pregnancy - 17% had symptomatic ovarian cysts, 13% had pelvic inflammatory disease, 8% had dysfunctional uterine bleeding and 7% had spontaneous abortions.

Various studies have been reported regarding the <u>effect of threatened abortion on pregnancy outcome</u>.

Johannsen (1970) in a study of 266 patients with threatened abortion found abortion in 135 (50.8%) cases, delivery in 49.2% cases including 106 full term and 25 pre-term.

Funderburk (1980) analysed obstetric and neonatal data of 259 deliveries complicated by first or second trimester vaginal bleeding. There was a high incidence of low birth weight (less than 2500 gms), low gestational

age (less than 37 wks.), perinatal death, asphyxia, breech presentation, placental infarct and small for date term infants. Fetal anomalies were slightly but not significantly raised. Combined suboptimal pregnancy outcome occurred in 29.7% deliveries compared to 15.2% of 25118 deliveries without bleeding (probability less than 0.001). The highest combined risk (61.5%) was for women without at least 2 prior abortion, premature birth or perinatal deaths and no prior term births.

Batzofin (1984) studied the effect of vaginal bleeding in first half of pregnancy on fetal outcome in 523 cases compared with control group of 6706. Early pregnancy bleeding was found to be associated more with pre-term deliveries and low birth weights. Neonatal death and low apgar score was seen more often than expected, but still birth rates, congenital anomalies and intra-uterine growth retardation rates were unaffected.

In a group of patients presenting with vaginal bleeding between 10 and 20 weeks of menstrual age, identification of a subchorionic haemorrhage was associated with a 50% fetal loss rate (Rumack Carol M, 1991).

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MATERIAL AND METHODS

MATERIAL AND METHODS

Cases for the present study were selected from the out patient department and those admitted in the department of Obstetrics and Gynaecology, M.L.B. Medical College, Jhansi.

Detailed history of patients was taken about the date and duration of amenorrhoea, period, amount and nature of bleeding episode (fresh, old blood clots and associated pain). The present and past history of menstrual cycles, and detailed obstetric history was noted. Period of gestation was calculated from first day of last menstrual period (LMP). The findings of general and local examination was recorded properly.

The patients were examined by 3.5 mhz. sector/ convex probe with full bladder technique, for this the patient was asked not to void her urine prior to coming for the scan and were advised to take plenty of oral fluids.

The advantages of a full bladder technique are :

- It displaces the gas filled intestinal loops out of the pelvis, thus enhancing the transmission of sound waves.

- Defects like anteverted uterus become parallel to the skin line which allows better sonographic evaluation of its texture and intraluminal contents.
- In early pregnancy it elevates the uterus nearer to the suprapubic area and thus improves the resolution of lower uterine segment.
- Full bladder acts as an acoustic window for pelvic structures.

Patient lies supine, lower abdominal wall was liberally smeared with coupling gel to secure absence of air gap between skin and transducer. First longitudinal and then transverse scans were taken. The uterine cavity, internal os, size and site of gestation sac and fetal heart movements, placental position, retroplacental bleeding, adnexal mass and other abnormal findings were noted. When the foetal pole is visualised, it is measured for crown rump length or BPD and femur length. The gestation age of pregnancy was calculated by gestation sac size, CRL, BPD or femur length using Hadlock F.P. table.

The commonest causes of bleeding per vaginum in early pregnancy are :

1. <u>Threatened Abortion</u> : was diagnosed when a live fetus was associated with commonly any of the following causes :

Subchorionic or retroplacental haemorrhage : this results from abruption of placental margin or marginal sinus rupture causing elevation of chorionic membrane. These haemorrhages when acute were usually hyperechoic or isoechoic relative to placenta and became sonolucent in 1-2 wks time.

Low lying placenta : referred to the placenta that covered the internal os of the cervix or partially covered it. Care was taken to re-scan the patient after asking the patient to void urine.

Twin pregnancy : was diagnosed when there were two separate gestational sacs (dichorionic twins) or two yolk sacs, two embryos, two amnions within one chorionic sac (monochorionic di amniotic twins) or one amnion, one or two yolk sacs, and two embryos within one chorionic sac (monochorionic monoamniotic twins).

2. <u>Inevitable Abortion</u> : was diagnosed when the gestational sac and fetus got detatched from the implantation site and lay in the lower uterine segment or vaginal canal. The cervix was dilated.

3. <u>Incomplete Abortion</u> : was diagnosed when only a part of the products of conception remained within the uterus and the rest of the products of conception were expelled out.

4. Complete Spontaneous Abortion : was diagnosed when all the products of conception had been expelled.

5. Missed Abortion : was diagnosed when the fetus without heart activity or limb movement still remained within the gestation sac. The fetus was sometimes smaller than the expected for the sac size or was formless depending on the length of the time since demise.

6. Blighted ovum : was diagnosed when it was Anembryonic pregnancy in which the gestation sac was present but was empty i.e. without an embryo.

7. Ectopic pregnancy : was diagnosed when the double decidual sac sign (two concentric echogenic rings surrounding the gestation sac) was absent and instead the pseudo-gestational sac was surrounded by a single echogenic halo resulting from the decidual changes due to hormonal stimulation in the uterus. In most of the cases adnexal mass was demonstrated. In ruptured ectopic pregnancy there was demonstration of fluid in the culdesac.

8. Hydatidiform mole : was diagnosed when a classic pattern of a solid collection of echoes with multiple anechoic spaces produced a typical snow storm appearance within the uterus without any evidence of fetus or placenta. Massive bilateral ovarian enlargement with multiple theca Lutein cysts were seen in some of the cases.

The cases with confirmed unsalvegable pregnancies were electively terminated. Rest were followed up till delivery or abortion. The aborted material was examined histologically.

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OBSERVATIONS

OBSERVATIONS

In the present study total 100 cases were studied who came in the Department of Obstetrics & Gynaecology, M.L.B. Medical College, Jhansi, with complaints of Bleeding per vaginum in early pregnancy. The patients were in the age group from 18-34 years.

Table I

Distribution of cases according to age.

Group	Age group (years)	No.of cases	Percentage
I	15 - 19	2	2.0
II	20 - 24	36	36.0
III	25 - 29	56	56.0
IV	30 - 35	6	6.0
Total		100	100.0

The table shows that most of the cases belonged to the age group between 20 - 30 years.

Table II

Out of 100 cases, 42 were primigravida and rest were multigravida. In multigravida the past history of abortion or bleeding per vaginum was present in 27 cases. All 100 cases were presented with bleeding per vaginum, some had additional complaints of pain in abdomen and passage of products of conception per vaginum.

Complaint	No. of cases
Pain in abdomen	47
Passage of products of conception	6
Total	53

Table III

Distribution of cases according to duration of amenorrhoea.

Duration of amenorrhoea	No. of cases	Percentage
Upto 12 weeks	62	62.0
13 - 20 weeks	38	38.0
Total	100	100.0

From this table it is observed that the incidence of bleeding per vaginum was higher in Ist trimester, out of which maximum cases reported were in the gestational age of 8-9 weeks.

Table XV

Distribution of cases according to gestational age.

Gestational age in weeks	No. of cases	Percentage
6 - 7	12	12.0
8 - 9	38	38.0
10 - 11	8	8.0
12 - 13	12	12.0
14 - 15	12	12.0
16 - 17	8	8.0
18 - 19	6	6.0
20	4	4.0
Total	100	100.0

Table V

Out of total 100 cases, clinically 72 cases were of threatened abortion and 1 case of blighted ovum. The diagnosis of missed abortion was kept in 9 cases, ectopic pregnancy in 9 cases, vesicular mole 5 cases and incomplete abortion 4 cases.

Distribution of patients according to clinical diagnosis.

Clinical diagnosis	No.of cases	Percentage
Threatened abortion	72	72.0
Missed abortion	9	9.0
Incomplete abortion	4	4.0
Vesicular mole	5	5.0
Blighted ovum	1	1.0
Ectopic pregnancy	9	9.0
Total	100	100.0

Table VI

Total of clinically diagnosed 72 cases, the ultrasonic findings were as follows : Normal viable foetus was seen in 3 cases, missed abortion 14 cases and threatened abortion in 42 cases.

Correlation of clinical diagnosis of threatened abortion and ultrasonographic diagnosis.

Ultrasonographic diagnosis cases	No.of cases	Percentage	Outcome
Normal pregnancy	3	4.15	Follow-up
Threatened abortion	42	58.30	Follow-up
Vesicular mole	3	4.15	D & C
Missed abortion	14	19.40	D & C
Blighted ovum	2	2.50	D & C
Complete abortion	-	-	Follow-up
Incomplete abortion	6	8.30	D & C
Ectopic pregnancy	2	2.50	Laparotomy
Total	72		

Table VII

All the 100 cases examined by Ultrasonography. 42 cases were of threatened abortion, 19 cases of missed abortion, 11 cases of ectopic pregnancy and only 1 of Anencephaly. Incomplete abortion seen in 8 cases, 7 cases were of molar pregnancy & blighted ovum seen in 4 cases.

Ultrasonic diagnosis in patients with bleeding per vaginum.

Diagnosis	No.of cases	Percentage
Threatened abortion	42	42.0
Normal pregnancy	4	4.0
Molar pregnancy	7	7.0
Missed abortion	19	19.0
Incomplete abortion	8	8.0
Ectopic pregnancy	11	11.0
Blighted ovum	4	4.0
Anencephaly	1	1.0
Complete abortion	4	4.0
Total	100	100.0

Table VIII

Total 72 cases diagnosed clinically as threatened abortion. By ultrasound scan only 42 cases were found to be correct. Rest 30 cases were present as follows : 14 of missed abortion, 6 of incomplete abortion, 3 each of normal pregnancy and molar pregnancy & 2 each of blighted ovum and ectopic pregnancy. On follow-up all confirmed the ultrasonic findings. Of the 100 cases 8 of the 9 clinically diagnosed ectopic pregnancy were confirmed on ultrasound, 1 was ruptured corpus luteal cyst. On follow-up 1 case was diagnosed as Bicornuate uterus with single fetus on laparotomy, 1 as ruptured corpus luteal cyst and rest as ectopic pregnancy. In our study, the 4 clinically diagnosed cases of incomplete abortion gave the impression on ultrasound of 3 complete abortion and 1 of ectopic pregnancy and were confirmed on follow-up.

One case from the total study came as blighted ovum clinically but on ultrasound was confirmed to be a twin pregnancy with missed abortion and had no discrepancy on follow-up.

Five molar pregnancy diagnosed clinically from the 100 cases on examination by ultrasound were found to have 3 confirmed cases of molar pregnancy and 1 of incomplete abortion and 1 of anencephaly.

There were 9 cases of missed abortion from 100 cases clinically but 4 were confirmed on ultrasound while 2 were of blighted ovum, and 1 each of incomplete abortion, hydatidiform mole and complete abortion.

Table VIII

Accuracy of clinical diagnosis after ultrasonography evaluation.

Diagnosis	Clinical diagnosis	Sonar diagnosis	Percentage of accuracy	Remaining cases were
Threatened abortion	72	42	59%	3 normal pregnancy 3 molar pregnancy 2 blighted ovum 6 incomplete abortion 14 missed abortion 2 ectopic pregnancy.
Ectopic pregnancy	9	7	77.7%	1 Bicornuate uterus with live pregnancy. 1 Ruptured corpus luteal cyst.
Incomplete abortion	4	0	0%	3 Complete abortion 1 ectopic pregnancy.
Blighted ovum	1	0	0%	1 Twin pregnancy with missed abortion.
Molar pregnancy	5	3	60%	1 Incomplete abortion. 1 Anencephaly.
Missed abortion	9	4	44.4%	2 Blighted ovum 1 Incomplete abortion. 1 Hydatidiform mole 1 Complete abortion.

Table IX

In the study 7 cases of Molar pregnancy were diagnosed by ultrasound scanning. Out of these 7 cases 4 were of complete vesicular mole (of which 2 had recurrence with vesicular mole), 1 case was partial mole with fetus and rest 2 had associated large theca luteal cysts.

Distribution of molar pregnancy cases.

Type	No.of cases	Percentage
Complete	4	57.1
Partial	1	14.2
Molar pregnancy with theca luteum cysts	2	28.4
Total	7	

Table X

Ultrasonography in the study diagnosed 42 cases of threatened abortion. Of these, low lying placenta was found in 6 cases and low lying placenta with marginal abruption seen in 17 cases, 11 cases had evidence of concealed haemorrhage and 5 cases were of partially separate placenta with low lying of fetus. 3 cases presented as twin pregnancy with low lying placenta and marginal abruption, out of which 1 case had recurrence after one month and thereafter aborted spontaneously. All cases had a closed internal os on ultrasonography.

Distribution of Threatened abortion cases.

Finding	No.of cases	Percentage
Low lying placenta	6	14.28
Low lying placenta with marginal abruption	17	40.50
Concealed haemorrhage with normal position of fetus	11	26.18
Partially separated placenta with low position of fetus	5	11.90
Twins	3	7.14
Total	42	

Table XI

The ultrasound diagnosis of Ectopic pregnancy was made in 11 cases. 3 cases showed well defined gestation sac with foetus/embryo outline and free fluid was not present. Cardiac activity was present in all the 3 cases. 2 cases had evidence of ill-defined complex mass in adnexal region without free fluid in cul-de-sac. There was ill-defined adnexal complex mass associated with free fluid in cul-de-sac in 6 cases. One case out of the 3 cases of well defined gestation sac with clear cul-de-sac proved to be a twin pregnancy in a bicornuate uterus on laparotomy. Pregnancy was confirmed by pregnancy test to confirm the diagnosis.

Distribution of Ectopic pregnancy cases.

Diagnosis	No.of cases	Percentage
Well defined Gestation sac with foetus/embryo outline with clear cul-de-sac with cardiac activity.	3	27.2
Ill-defined adnexal complex mass without free fluid in cul-de-sac	2	18.4
Ill-defined adnexal complex mass with fluid in cul-de-sac	6	54.4
Total	11	

Table XII

Out of the 100 cases studied, after clinical examination, 31 cases showed small for date uterus. On ultrasound scanning, 19 cases were found to be of missed abortion, 4 of blighted ovum and 8 of incomplete abortion.

Ultrasonic diagnosis	No.of cases	Percentage
Missed abortion	19	42.9
Blighted ovum	4	19.3
Incomplete abortion	8	38.7
Total	31	

Table XIII

Of the 100 cases studied, after clinical examination, 12 cases showed large for date uterus. On ultrasound scanning, 7 cases were of vesicular mole and 4 of twin pregnancy. 1 case was of Anencephaly with polyhydramnios.

Ultrasonic diagnosis	No.of cases	Percentage
Vesicular mole	7	58.4
Multiple pregnancy	4	33.3
Anencephaly	1	8.3
Total	12	

Table XIV

There were 19 cases of missed abortion diagnosed by ultrasonography. One case had an associated corpus luteum cyst right ovary. The maximum number of cases had a period of amenorrhoea between 8-10 weeks duration.

Distribution of missed abortion cases.

Duration of Amenorrhoea	No.of patients	Missed Abortion (Duration according to CRL)
8 weeks	4	6 weeks
9 weeks	3	6 weeks
10 weeks	2	8 weeks
	2	6 weeks
11 weeks	1	7 weeks
12 weeks	2	8 weeks
	2	9 weeks
14 weeks	1	10 weeks
	1	12 weeks
16 weeks	1	13 weeks
Total	19	

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Complete VESICULAR MOLE

Fig. 1 : 2X View uterus. Lumen is filled with Echogenic mass with grape like fluid filled. Anechoic areas.

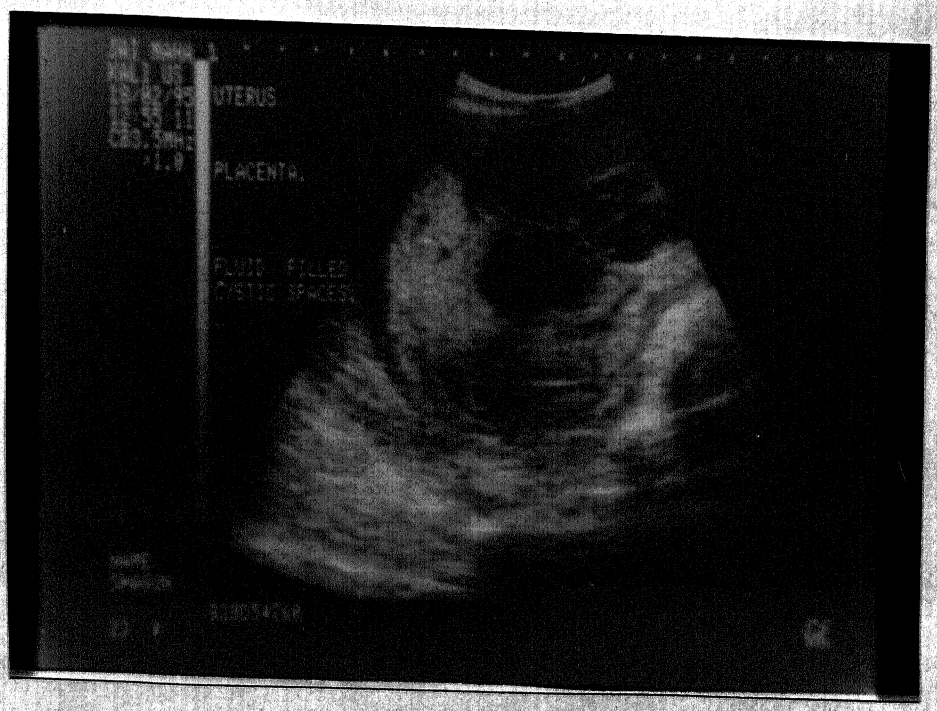

Fig. 2 : Partial vesicular mole. Uterus is showing Placenta and Vesicular mole mass.

Fig. 3 : Ruptured Ectopic Pregnancy.
Complex Echogenic Adenexal mass
with fluid in Cul-de-sac.

Fig. 4 : 2X View Missed Abortion.
Two gestation sacs are seen.

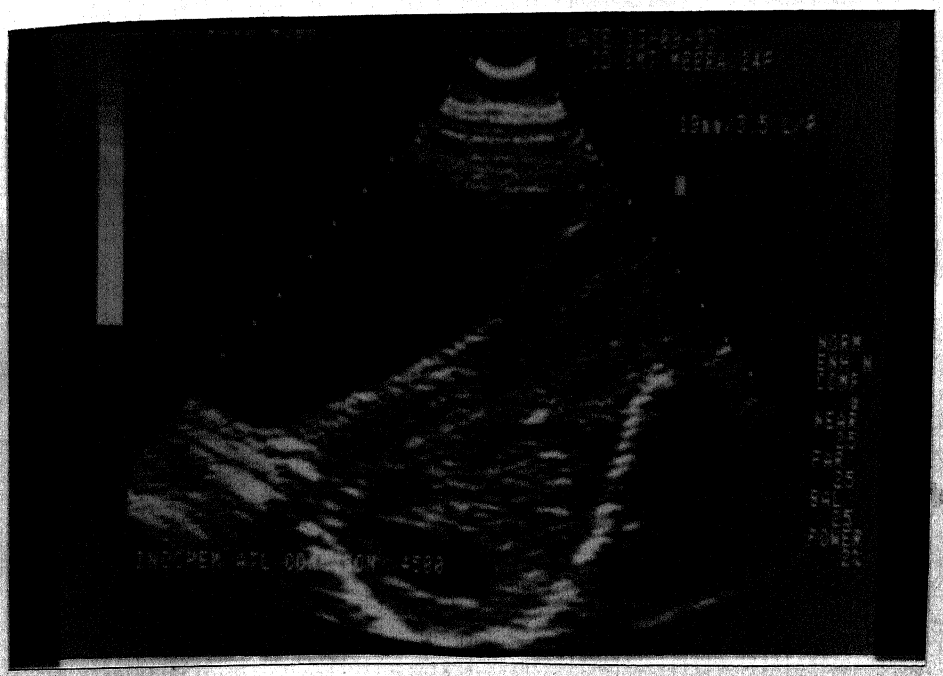

Fig. 5 : Intact Ectopic Pregnancy. Well defined Extra-uterine Gestation sac with Live foetus seen.

Fig. 6 : Double Pregnancy in Bicornuate uterus. Two different gestation sacs with live foetus seen in Two separate cornua of uterus.

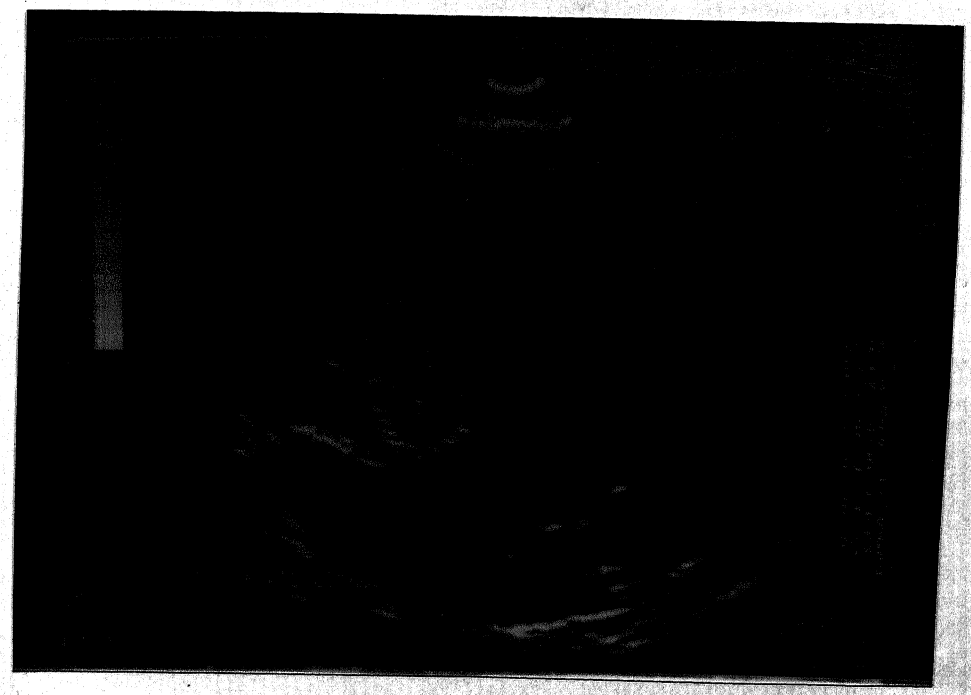

Fig. 7 : Bicornuate uterus with single pregnancy. One cornua is showing Gestation sac with live foetus. Second cornua showing Decidual Reaction.

Fig. 8 : Vesicular mole with theca Lutein cyst ovary.

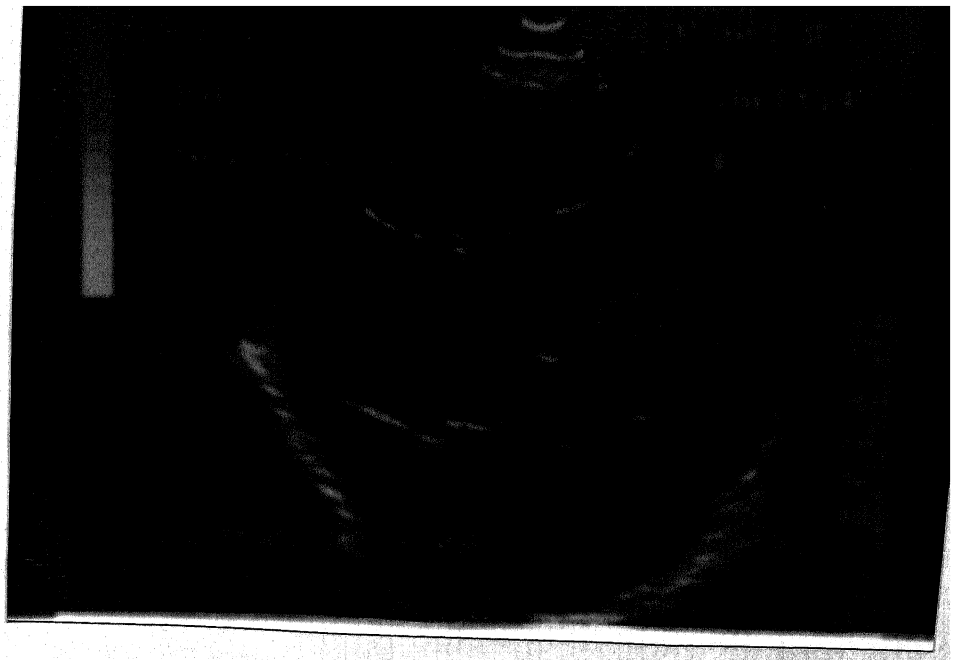

Fig. 9 : Large theca Lutein cyst.
Ovary in Vesicular mole.

Fig. 10 : Twin Pregnancy.
Diamniotic, Dichorionic
Twin Pregnancy.

DISCUSSION

DISCUSSION

Complaints of bleeding per vaginum and abdominal pain are commonly presented by the patients in early pregnancy. To treat the cause with undue delay on the basis of a definitive diagnosis based on clinical findings poses a problem to the obstetricians, causes an unnecessary prolonged stay at the hospital and delayed management of the case.

To overcome this hurdle a safe, quick and non-invasive diagnostic technique which can be relyed upon is - ultrasound scanning. This modality unlike X-ray doesn't involve any hazard to the fetus or mother. It is helpful to confirm the pregnancy, it's viability, any associated complications and prognosis.

As far the management of these cases is concerned, the viability of the fetus must be ascertained to institute proper care to the patient. For this ultrasound proves to the most efficient in providing the accurate diagnosis as both immunological detection of pregnancy (by human chorionic gonadotrophic hormone assay which may give false positive and false negative results) and clinical diagnosis is not so accurate. The clinical diagnosis of threatened abortion is based on the history

of slight vaginal bleeding a reddish brown discharge while if there is heavy bleeding (passage of clots) and lower abdominal pain the diagnosis goes in favour of incomplete abortion or ectopic pregnancy. These symptoms usually lead to a correct diagnosis but often are misleading as even if the embryo is not alive bleeding may stop after sometime or there may be only slight spotting or the pregnancy test may remain positive long after the fetal death e.g. in missed abortion. Similarly the size of the uterus may not be significantly smaller than the period of gestation even after the death of the fetus.

The present study of 100 cases was undertaken to highlight the use of ultrasound in the pregnancies complicated with bleeding per vaginum during the first 20 weeks of gestation.

These 100 cases were clinically suspected to have threatened abortion, missed abortion, vesicular mole, incomplete abortion and ectopic pregnancy. Out of the 72 patients of threatened abortion, only 42 were found to be of threatened abortion by ultrasound. Of the 9 clinically diagnosed missed abortion, the ultrasound findings of missed abortion were present in 4 cases; out of 9 cases, 7 cases of ectopic gestation were confirmed by ultrasound. Out of 7 cases, 4 cases were of ruptured ectopic pregnancy and 3 cases of intact

ectopic pregnancy. On laparotomy 5 cases were found to be ectopic pregnancy confirmed, while 1 was a live pregnancy in a Bicornuate uterus, and 1 was a ruptured corpus luteal cyst.

Robert G. Blair (1961) commented on a similar condition, that an ectopic pregnancy may be mistakenly diagnosed where pregnancy occurs in a Bicornuate uterus or arcuate uterus, accompanied by signs of threatened abortion.

In total 4 cases of clinically diagnosed incomplete abortion, there was 1 of ectopic pregnancy and 3 of complete abortion.

One case which was clinically suspected to be Blighted ovum proved to be a twin pregnancy with missed abortion on ultrasound scanning.

Of the 5 cases of vesicular mole, 3 were molar pregnancy, 1 of incomplete abortion, 1 of anencephaly. Table VIII shows the comparative study of clinical and ultrasonic diagnosis in each pregnancy with bleeding per vaginum.

Clinically 42 patients were diagnosed to have threatened abortion. Out of these, 11 had concealed haemorrhage with normal position of fetus (26.18%), 6 low lying placenta (14.28%), 17 (40.15%) were of

low lying placenta with marginal abruption, 5 partially separate placenta with low lying fetus (11.9%) & 3 twin pregnancy with subchorionic haemorrhage and low lying placenta (7.14%). Of the rest 3 of them were diagnosed to have vesicular mole, 14 missed abortion and 6 incomplete abortion, 2 blighted ovum & 2 ectopic pregnancy which were advised immediate termination of pregnancy. 3 had a normal pregnancy.

Donald and Abdulla (1967) scanned 63 patients of threatened abortion, of which only 56 patients (84.6%) had confirmed diagnosis of threatened abortion on ultrasonic scanning while 4 cases had no evidence of pregnancy, 2 had vesicular mole and 1 had missed abortion. In our study, 72 cases of clinically diagnosed threatened abortion, 42 were of threatened abortion on scanning, 14 had missed abortion, 3 had vesicular mole and 6 had incomplete abortion; 2 had ectopic pregnancy & 2 had blighted ovum and 3 were of normal pregnancy.

Thankam R. Varma (1972) in a study with 90 clinically diagnosed as threatened abortion found that only 65 had threatened abortion while 2 had vesicular mole, 10 incomplete abortion, 10 missed abortion and 3 had normal uterus. In the same study 15 clinically diagnosed to be missed abortion, on ultrasonic examination 6 were of mistaken maturity and 4 of normal pregnancy. Similarly 20 ectopic gestation clinically were in

reality only, 6 on ultrasound and 10 were of intra-uterine pregnancy and 4 of non-pregnant state. In our study 9 cases of suspected missed abortion, after ultrasound scanning 4 were of missed abortion, 2 of blighted ovum, 1 of incomplete abortion, 1 complete abortion and 1 of molar pregnancy. Similarly, 9 cases clinically diagnosed as ectopic gestation, on ultrasound scanning, 7 were confirmed to be ectopic gestation while one was of bicornuate uterus with live pregnancy and other was ruptured corpus luteal cyst on laparotomy.

Arun (1981) scanned 1152 patients with clinical diagnosis of threatened abortion. The result was 375 (32.5%) threatened abortion, 124 (10.8%) missed abortion, 128 (11.1%) blighted ovum, 324 (28.1%) incomplete abortion, 200 (17.4%) complete abortion and 1 molar pregnancy.

T.G. Gorade et al (1991) scanned 90 patients to evaluate the accuracy of clinical diagnosis after ultrasound scanning in bleeding per vaginum in early pregnancy and came up with the result as follows :

Threatened abortion	68% accuracy
Missed abortion	80% accuracy
Incomplete abortion	66% accuracy
Vesicular mole	66% accuracy
Ectopic pregnancy	60% accuracy.

Total accuracy was 68.9%.

While in our study the result were :

Threatened abortion	59.0% accuracy
Missed abortion	44.4% accuracy
Incomplete abortion	0% accuracy
Vesicular mole	60.0% accuracy
Ectopic pregnancy	77.7% accuracy

Anuradha Khanna et al (1992) in a similar study had the following result regarding the accuracy of clinical diagnosis after ultrasound scanning :

Threatened abortion	54.5%
Placenta praevia	65.2%
Molar pregnancy	85.7%
Incomplete abortion	66.6%
Ectopic pregnancy	100.0%
Missed abortion	40.0%
Accidental haemorrhage	20.0%

Total accuracy was 95.5%.

Platt (1980) scanned 22 patients with clinical diagnosis of fetal death but on scanning 8 (36%) of them had live fetus. Arun (1987) also had emphasized the necessity of repeated examination of the uterine contents by ultrasound before infering anything. He stressed that single examination of the products of conception was rarely able to conclude a result except in molar pregnancy and missed abortion which could be diagnosed by single ultrasonic examination.

Blighted ovum is diagnosed by identifying a normal or small sized gestation sac which has no fetal echoes. These patients are however rescanned after 1-2 weeks later to confirm the diagnosis. Donald et al (1972) and Drumm (1975) too pointed out that there is always a possibility of erroneous diagnosis of blighted ovum in some cases.

Frank P. Hadlock in a study of molar pregnancy reported that diagnostic accuracy of sonography should exceed 90% and differential diagnosis based on sonographic findings is actually quite limited. It has been reported that in 25 - 60% cases, multiple theca lutein cysts may be seen in the adnexal region and that 5% may contain a coexistant fetus. In our study, 28.4% cases had bilateral theca lutein cysts and 14.2% had a partial or incomplete mole.

Michael M. Reid et al (1983) in his sonographic evaluation of hydatidiform mole demonstrated that only 1 out of 17 patients examined with ultrasound equipment failed to demonstrate diffuse cystic placental changes in a proven complete hydatidiform mole; this occurred in a patient with active bleeding in whom clots and free blood confused the sonographic picture. Complete hydatidiform moles were reliably identified in patients of 8-17 weeks menstrual age, and seven of these patients were 12 weeks or less size by dating from the last menstrual period.

T.R. Varma (1981) in his study of low implantation of the placenta in early pregnancy concluded that with a low lying placenta with or without the placental edge covering the internal os, showed that the patients in whom the placental edge covered the internal os either partially or completely had a higher incidence of placenta pravia, recurrent bleeding and abortion. The ultrasonic diagnosis of a low lying placenta but not covering the internal os, will by growth of the uterine cavity be found to be in the upper segment at a repeat scan in the late third trimester. This group of patients showed no evidence of increased incidence of bleeding and abortion as compared with the group who had the placenta in the upper uterine cavity. In our study our findings were consistent with the above conclusion.

Nabil F. Haklad et al (1978) gave the overall accuracy of grey scale ultrasound in the diagnosis of ectopic pregnancy to be 92.3%. In his study of 39 cases there were 13 true positive and 23 true negative diagnoses. The accuracy of positive ultrasonic diagnosis was 92.8% and of negative diagnosis was 92%. There was one false positive case in which laparoscopy and subsequent laparotomy revealed a haemorrhagic corpus luteum cyst. The 2 false negative cases were diagnosed as inflammatory pelvic masses. Both patients had chronic ruptured ectopic pregnancy at laparotomy. While in our

study, out of the 7 ectopic gestations diagnosed on ultrasound examination, 5 were confirmed on laparotomy and 1 was the live pregnancy in a bicornuate uterus and 1 ruptured corpus luteal cyst.

In our study 12 cases had a large for date uterus size i.e. more than the period of amenorrhoea. Among these, 7 cases were diagnosed to be of molar pregnancy. In the rest 4 were of twin pregnancy and 1 of anencephaly. Since multiple pregnancy carry a high risk for complications (placenta praevia, abruptio placentae, hydramnios, pre-eclampsia, anemia, congenital malformation, pre-term labour) in pregnancy as it advances, it should be diagnosed as early as possible in order to provide special care to these patients so that the pregnancy is carried out uneventful. According to Frank P. Madlock, 47% twins are not detected clinically until after 30 weeks of gestation. It is expected that an ultrasound examination at 15-16 weeks should become a routine so that multiple gestation cases are given specialised care early enough. The accuracy rate for detecting twins in the second trimester with real time ultrasound should approach 100%. Even in our study the accuracy was 100%.

In this study, 31 cases had a small for date uterus. On ultrasound scanning we found that 19 were of missed abortion, 4 of blighted ovum and 8 had incomplete abortion.

Robinson (1975) in his study found that missed abortions and blighted ovum comprised the largest group on analysis of the sonar and post-abortal findings of the aborted pregnancies in the first half of pregnancy. In our study, threatened abortions (i.e. subchorionic haemorrhage and low lying placenta being the major cause of threatened abortion) and missed abortions comprised the major portion of our sonar and post-abortal findings.

One case of missed abortion with ovarian cyst was operated for removal of cyst after dilatation and evacuation of the uterine contents. Hence ultrasonic scanning proves an aid in the management of not only complicated pregnancy but also in other associated pathologies which may hinder pregnancy or labour thereafter.

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SUMMARY AND CONCLUSION

SUMMARY AND CONCLUSION

Ultrasonography being the easiest, safest and non-invasive method for visualisation of the fetus and it's associated anomalies is widely in current use. Ultrasound waves are similar to audible sound waves in the sense that both are mechanical pressure waves requiring a medium to propagate. The difference lies in the range of frequency, that is, audible sound waves range 20 - 16,000 Hz. while ultrasound waves utilised in medical practice are of the range of 1 - 10 Mega Hertz.

The present study deals with the work on 100 cases in the first 20 weeks of gestation. The common complaints of these patients were of vaginal bleeding, pain in abdomen, passage of products of conception and disproportionate size of gravid uterus. Ultrasound scanning was performed following clinical examination and the cases were followed till delivery, laprotomy or D & C. Pregnancy test and histopathological tests were done when required to confirm the diagnosis.

The results arrived at, are summarised as follows -

1. Most of the cases were multigravida (50%). Age of the cases ranged from 15-35 years. Majority were between 20 - 30 yrs of age.

2. 62% of the total cases belonged to the first trimester group. Majority in 8-9 weeks gestational age group, while 38% were in the early second trimester (upto 20 wks.).

3. All patients (100) gave history of vaginal bleeding. Out of these, 47 cases had associated pain in abdomen and 6 gave history of passage of products of conception.

4. The individual percentage of the abnormal pregnancies based on ultrasound scanning was - vesicular mole 7%, missed abortion 19%, blighted ovum 4%, ectopic pregnancy 11%, anencephaly 1%, complete abortion 4%, incomplete abortion 8%.

5. Accuracy of multiple pregnancy in ultrasound diagnosis was 100%. The placental site detected on sonography only, proved to be very helpful in the obstetrical management.

6. On ultrasound examination, the incidence of ectopic pregnancy was 11% and 1% of ruptured corpus luteal cyst but on laparotomy 1% showed a bicornuate uterus with live pregnancy.

7. Vesicular mole had incidence of 7%, out of which 14.2% had partial mole and 28.4% had theca luteum cysts.

8. 31% cases had a small for date uterus. Among this, 19% were of missed abortion, 4% blighted ovum and 8% incomplete abortion.

9. The incidence of large for date uterus was 12%. Out of this, 7% had molar pregnancy, 1% anencephaly with polyhydramnios and 4% twin pregnancy.

10. 5.2% of the missed abortion cases had an associated corpus luteal cyst.

To conclude, the above results lead us to believe that the role of ultrasound in bleeding per vaginum in early pregnancy is very valuable. In these cases of early pregnancy with or without associated complaints, ultrasound scanning aids to confirm the clinical diagnosis of threatened abortion, vesicular mole, missed abortion, complete abortion, incomplete abortion, ectopic pregnancy and blighted ovum. Had the obstetrician totally depended on the clinical diagnosis for managing the cases it would have delayed the treatment not excluding the possibility of a wrong decision. Ultrasonography helps to arrive at a correct diagnosis in a quick, easy, non-invasive manner without any hazard to the fetus and mother.

In Bundelkhand area known for it's illiteracy and poverty, this diagnostic tool provides invaluable

help to institute an early management as the patients usually arrive at the hospital in a critical state mostly due to their own negligence. Therefore, it should be aimed to establish a routine ultrasound examination antenatally in early pregnancy.

Thus for the obstetricians, ultrasonography is almost priceless for their patients.

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